The accompanying photographs show components of a new digital radiography system designed for improved efficiency, flexibility and cost-effectiveness in hospital radiographic examinations. Developed and built by DigiRad Corporation, Palo Alto, California, it is called System One and is intended to reduce hospital operating costs by eliminating the expense of film in x-rays and other image acquisition procedures.

With System One, patient radiographic examinations are conducted in the standard manner except that body images are not recorded on film but on the DigiRad RIM®, or Reusable Image Medium, essentially an intensifying screen that is capable of retaining an image. System One "reads" the RIM with a laser scanner (not pictured) and uses the scan information to produce a digital image in the image processor shown at upper right. The image is then stored in the computer's memory; the RIM, meanwhile, is automatically erased so that it can be used again. Images are stored on optical disks that can accommodate 400 images on a platter the size of a phonograph record.

In the reading room, a radiologist selects images from System One's directory for display on the physician's console (lower photo). A key element of System One is what DigiRad calls "energy selective imaging," an image enhancement feature that improves diagnostic capability by enabling the system's operator to subtract certain features. For example, the radiologist can "dial away" the ribs in a chest picture or remove soft tissue from the image; this permits the physician to compare—on the three image screens of the console—standard, bone-subtracted or soft tissue-subtracted views.

Filmless radiography, says DigiRad, substantially lowers the direct cost of making images (film cost) and provides additional indirect savings of significant order by eliminating the need for film accessory equipment, by compressing image storage space and by improving productivity in calling up images. System One is compatible with all existing radiographic equipment and it produces high resolution

images, resolving the problem of image quality loss incurred in prior attempts to eliminate film.

System One incorporates digital imaging technology —specifically the energy selective technology—developed by Stanford University with support from NASA grants. One of the participants in the Stanford research program, Dr. Robert E. Alvarez, now chairman of the board of DigiRad, obtained a license from Stanford for commercialization of the digital radiography system, which was introduced to service in 1984. ▲

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